PDSF Users Meeting

* PDSF performance
* announcements
* AOB

April 11, 2017

Jan Balewski

aggregated load on PDSF interactive nodes

https://portal-auth.nersc.gov/pdsf-mon/

Table 2 List of big users

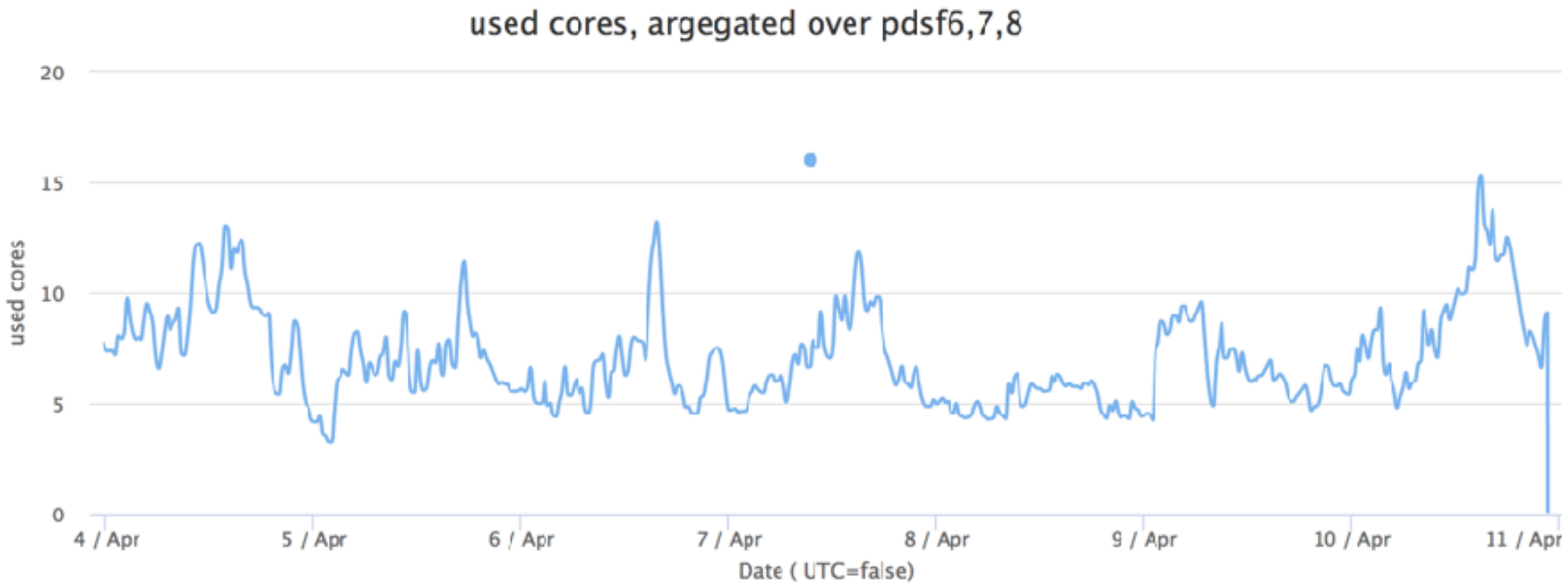
user	use (core)	num jobs	use CPU (day)	list of jobs	flag
whl6	0.9	1	3.51	['pdsf7:emacs']	1
rlinehan	2.0	2	0.87	['pdsf8:BACCARATExecuta', 'pdsf8:BACCARATExecuta']	0
pchu	2.0	2	26.90	['pdsf7:emacs', 'pdsf8:emacs']	1
tdavison	1.0	1	5.24	['pdsf7:BACCARATExecuta']	1

some programs
tend to stuck - kill them
before log-out

Query MongoDb : PLOT history last 502 records, set to last: day, week, month

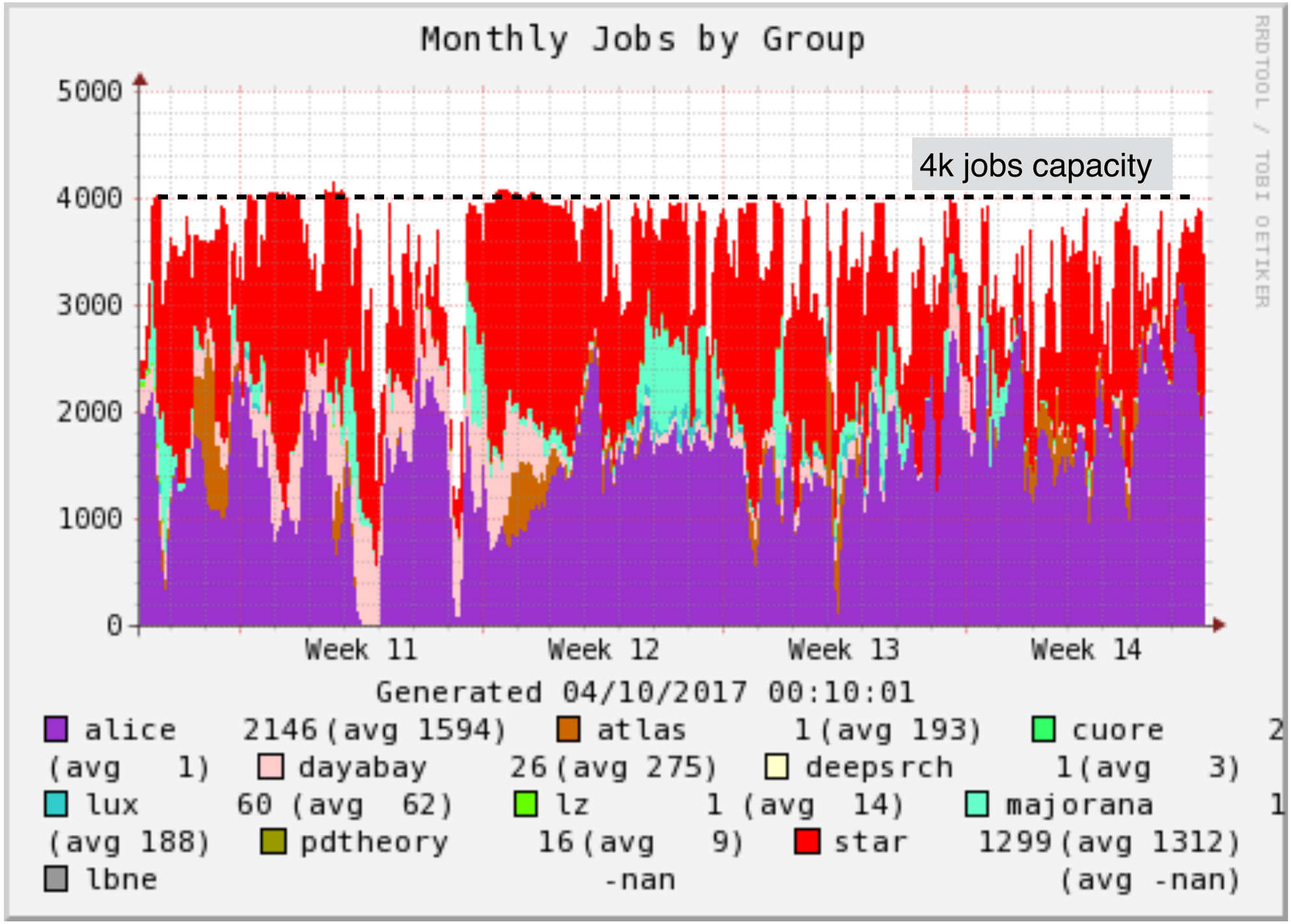
Change time zone for x-axis : UTC off , UTC on

PLOT:



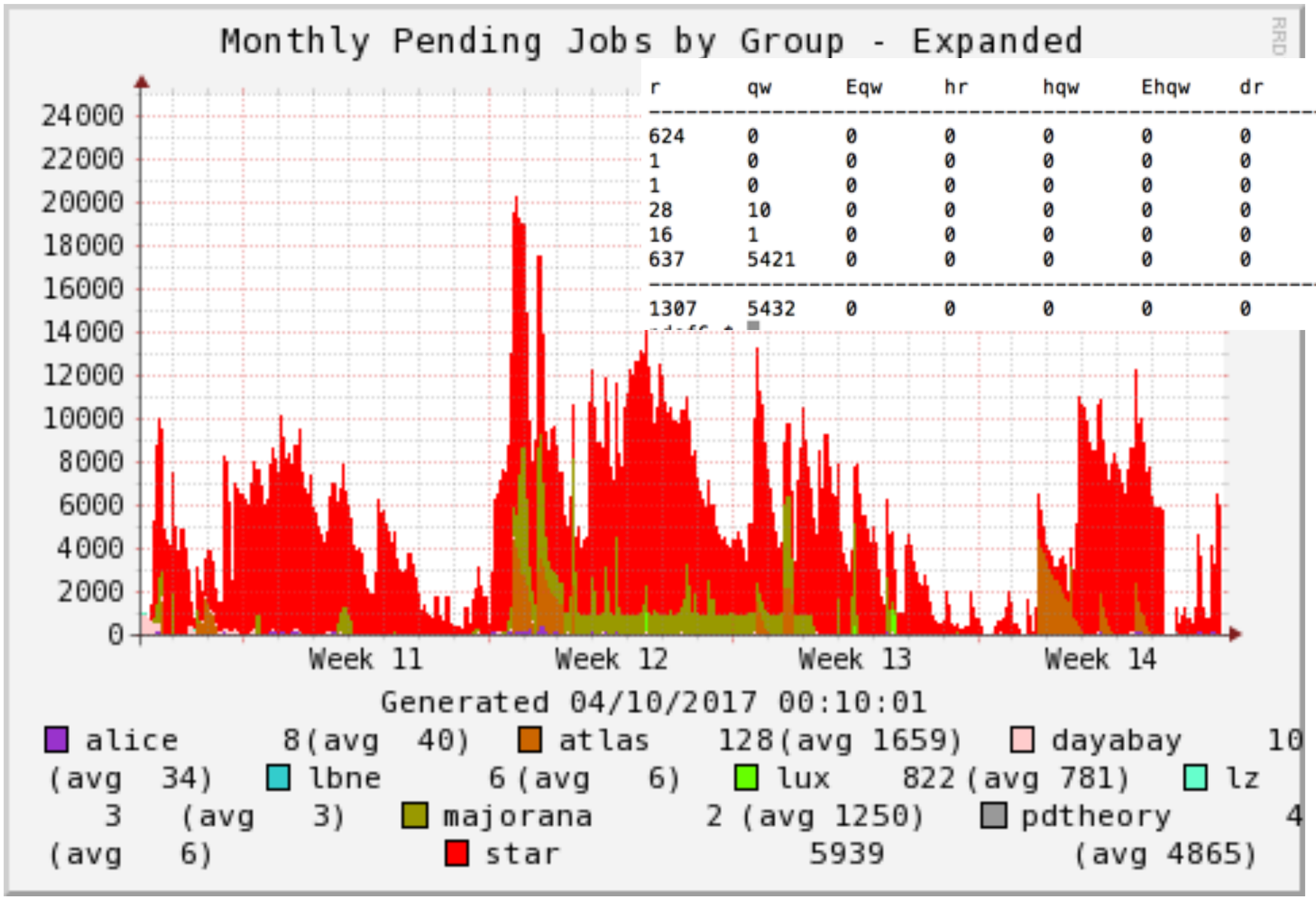
CPU Utilization is not great

- not enough jobs submitted and/or
- few STAR user submit enough jobs but they are throttled because xrootd can't keep up w/ job demand



UGE queue load

Not enough submitted jobs
or by users w/ reduced running privileges



r	qw	Eqw	hr	hqw	Ehqw	dr	dt	jobIDs	Project
624	0	0	0	0	0	0	0	624	alice
1	0	0	0	0	0	0	0	1	atlas
1	0	0	0	0	0	0	0	1	cuore
28	10	0	0	0	0	0	0	38	dayabay
16	1	0	0	0	0	0	0	17	pdtheory
637	5421	0	0	0	0	0	0	643	star
1307	5432	0	0	0	0	0	0	1324	Totals

Utilization of PDSF compute nodes

April average
Served 3364 vCores
Capacity 4000 vCores
CPU utilization 0.76

March Average
Served 3460 vCores
Capacity 4000 vCors
CPU utilization 0.71

end-time was set to 2017-04-10 20:15, DB collName=u

user \ timeRange	sum last 7_days	sum last 30_days	sum last 30_days
0-all-users : owner	59.2 (cpu*year) , 235462 jobs wallT fract=1.000, CPU eff=0.76	276.5 (cpu*year) , 1140416 jobs wallT fract=1.000, CPU eff=0.76	282.4 (cpu*year) , 1760555 jobs wallT fract=1.000, CPU eff=0.71
alice : project	35.9 (cpu*year) , 43544 jobs wallT fract=0.607, CPU eff=0.63	129.2 (cpu*year) , 167883 jobs wallT fract=0.467, CPU eff=0.68	114.1 (cpu*year) , 202731 jobs wallT fract=0.404, CPU eff=0.82
atlas : project	2.1 (cpu*year) , 34038 jobs wallT fract=0.036, CPU eff=0.98	7.8 (cpu*year) , 109082 jobs wallT fract=0.028, CPU eff=0.76	3.7 (cpu*year) , 110413 jobs wallT fract=0.013, CPU eff=0.68
dayabay : project	0.6 (cpu*year) , 1960 jobs wallT fract=0.009, CPU eff=0.92	18.9 (cpu*year) , 34902 jobs wallT fract=0.068, CPU eff=0.35	63.8 (cpu*year) , 101074 jobs wallT fract=0.226, CPU eff=0.17
dybprod : owner	0.0 (cpu*year) , 0 jobs wallT fract=0.000, CPU eff=0.00	0.0 (cpu*year) , 0 jobs wallT fract=0.000, CPU eff=0.00	
hack : owner	0.3 (cpu*year) , 1447 jobs wallT fract=0.006, CPU eff=0.95	18.7 (cpu*year) , 34377 jobs wallT fract=0.068, CPU eff=0.34	
lux : project	0.0 (cpu*year) , 21 jobs wallT fract=0.000, CPU eff=0.94	1.5 (cpu*year) , 18492 jobs wallT fract=0.005, CPU eff=0.62	1.8 (cpu*year) , 8886 jobs wallT fract=0.007, CPU eff=0.17
lz : project	0.0 (cpu*year) , 3600 jobs wallT fract=0.000, CPU eff=0.49	0.1 (cpu*year) , 5581 jobs wallT fract=0.000, CPU eff=0.82	5.8 (cpu*year) , 381699 jobs wallT fract=0.020, CPU eff=0.95
majorana : project	0.2 (cpu*year) , 9178 jobs wallT fract=0.003, CPU eff=0.77	12.0 (cpu*year) , 238318 jobs wallT fract=0.043, CPU eff=0.74	9.5 (cpu*year) , 173790 jobs wallT fract=0.034, CPU eff=0.93
star : project	20.2 (cpu*year) , 140159 jobs wallT fract=0.341, CPU eff=0.92	106.3 (cpu*year) , 562115 jobs wallT fract=0.385, CPU eff=0.92	82.1 (cpu*year) , 780320 jobs wallT fract=0.291, CPU eff=0.90
staremb : owner	0.0 (cpu*year) , 0 jobs wallT fract=0.000, CPU eff=0.00	14.5 (cpu*year) , 8624 jobs wallT fract=0.052, CPU eff=1.00	
zmarshal : owner	0.0 (cpu*year) , 7 jobs wallT fract=0.000, CPU eff=0.15	0.0 (cpu*year) , 31 jobs wallT fract=0.000, CPU eff=0.19	

I/O monitoring added

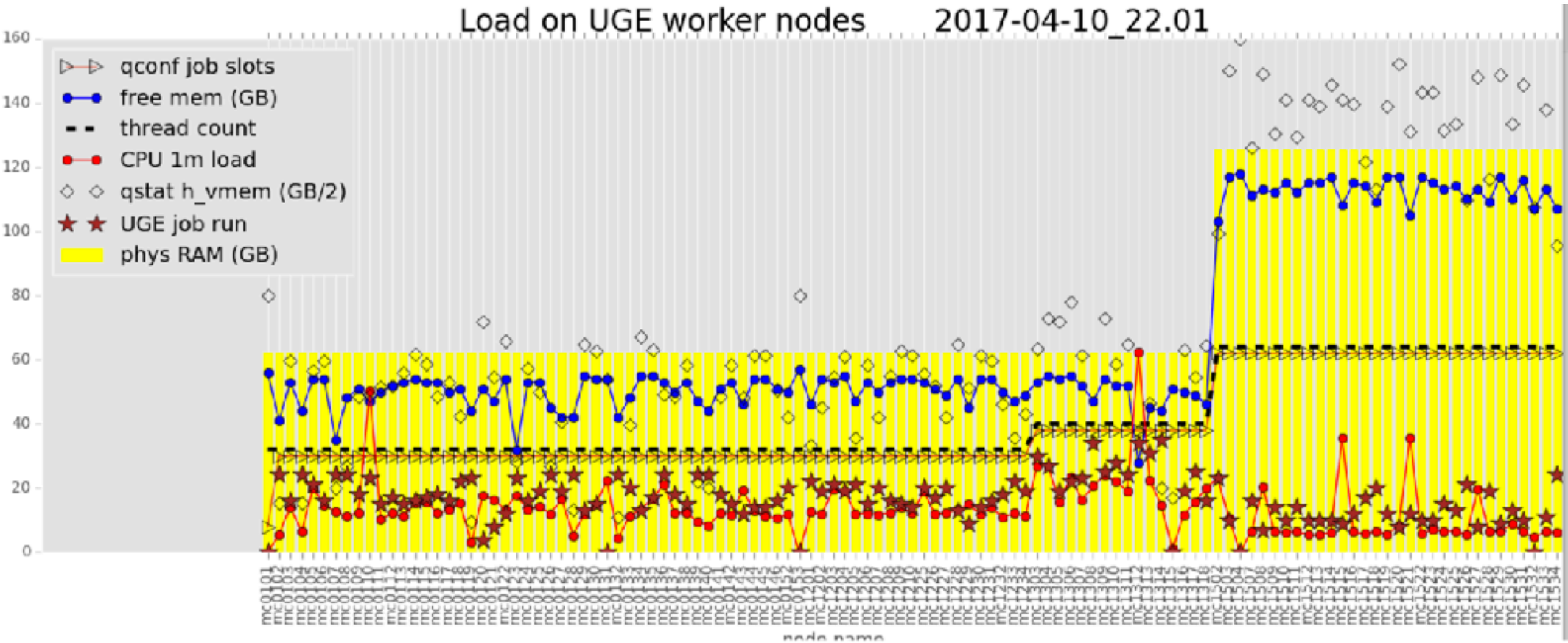
added dybspade

UGE usage report cron-generated: 2017-04-12_13.33, took 26.6 minutes
end-time was set to 2017-04-12 13:07, DB collName=ugeJobs2017

user \ timeRange	**sum last 7_days**	**sum last 3_days**	**sum last 30_days**
0-all-users : owner	56.7 (cpu*year) , 254209 jobs wallT fract=1.000, CPU eff=0.75	18.0 (cpu*year) , 112571 jobs wallT fract=1.000, CPU eff=0.68	271.2 (cpu*year) , 1157182 jobs wallT fract=1.000, CPU eff=0.75
alice : project	31.7 (cpu*year) , 61204 jobs wallT fract=0.558, CPU eff=0.57	7.3 (cpu*year) , 34422 jobs wallT fract=0.405, CPU eff=0.26	125.9 (cpu*year) , 188688 jobs wallT fract=0.464, CPU eff=0.65
atlas : project	1.4 (cpu*year) , 28116 jobs wallT fract=0.025, CPU eff=0.98	0.0 (cpu*year) , 4086 jobs wallT fract=0.002, CPU eff=0.95	6.5 (cpu*year) , 107109 jobs wallT fract=0.024, CPU eff=0.81
dayabay : project	0.6 (cpu*year) , 1995 jobs wallT fract=0.011, CPU eff=0.94	0.1 (cpu*year) , 373 jobs wallT fract=0.006, CPU eff=0.95	17.6 (cpu*year) , 33023 jobs wallT fract=0.065, CPU eff=0.36
dybprod : owner	0.0 (cpu*year) , 10 jobs wallT fract=0.000, CPU eff=0.04	0.0 (cpu*year) , 10 jobs wallT fract=0.000, CPU eff=0.04	0.0 (cpu*year) , 10 jobs wallT fract=0.000, CPU eff=0.04
dybspade : owner	0.0 (cpu*year) , 0 jobs wallT fract=0.000, CPU eff=0.00	0.0 (cpu*year) , 0 jobs wallT fract=0.000, CPU eff=0.00	0.0 (cpu*year) , 0 jobs wallT fract=0.000, CPU eff=0.00
hack : owner	0.4 (cpu*year) , 1653 jobs wallT fract=0.007, CPU eff=0.95	0.1 (cpu*year) , 363 jobs wallT fract=0.006, CPU eff=0.95	17.4 (cpu*year) , 32492 jobs wallT fract=0.064, CPU eff=0.35
lux : project	0.0 (cpu*year) , 141 jobs wallT fract=0.000, CPU eff=1.00	0.0 (cpu*year) , 120 jobs wallT fract=0.002, CPU eff=1.00	1.4 (cpu*year) , 18211 jobs wallT fract=0.005, CPU eff=0.60
lz : project	0.0 (cpu*year) , 3561 jobs wallT fract=0.000, CPU eff=0.46	0.0 (cpu*year) , 2511 jobs wallT fract=0.001, CPU eff=0.37	0.1 (cpu*year) , 5581 jobs wallT fract=0.000, CPU eff=0.82
majorana : project	0.2 (cpu*year) , 10404 jobs wallT fract=0.004, CPU eff=0.75	0.1 (cpu*year) , 5051 jobs wallT fract=0.003, CPU eff=0.70	11.7 (cpu*year) , 216786 jobs wallT fract=0.043, CPU eff=0.74
star : project	22.6 (cpu*year) , 145961 jobs wallT fract=0.398, CPU eff=0.93	10.4 (cpu*year) , 65848 jobs wallT fract=0.576, CPU eff=0.91	107.3 (cpu*year) , 583663 jobs wallT fract=0.396, CPU eff=0.92
staremb : owner	0.0 (cpu*year) , 0 jobs wallT fract=0.000, CPU eff=0.00	0.0 (cpu*year) , 0 jobs wallT fract=0.000, CPU eff=0.00	14.5 (cpu*year) , 8624 jobs wallT fract=0.053, CPU eff=1.00
zmarshal : owner	0.0 (cpu*year) , 7 jobs wallT fract=0.000, CPU eff=0.14	0.0 (cpu*year) , 3 jobs wallT fract=0.000, CPU eff=0.11	0.0 (cpu*year) , 31 jobs wallT fract=0.000, CPU eff=0.20

UGE CPU utilization

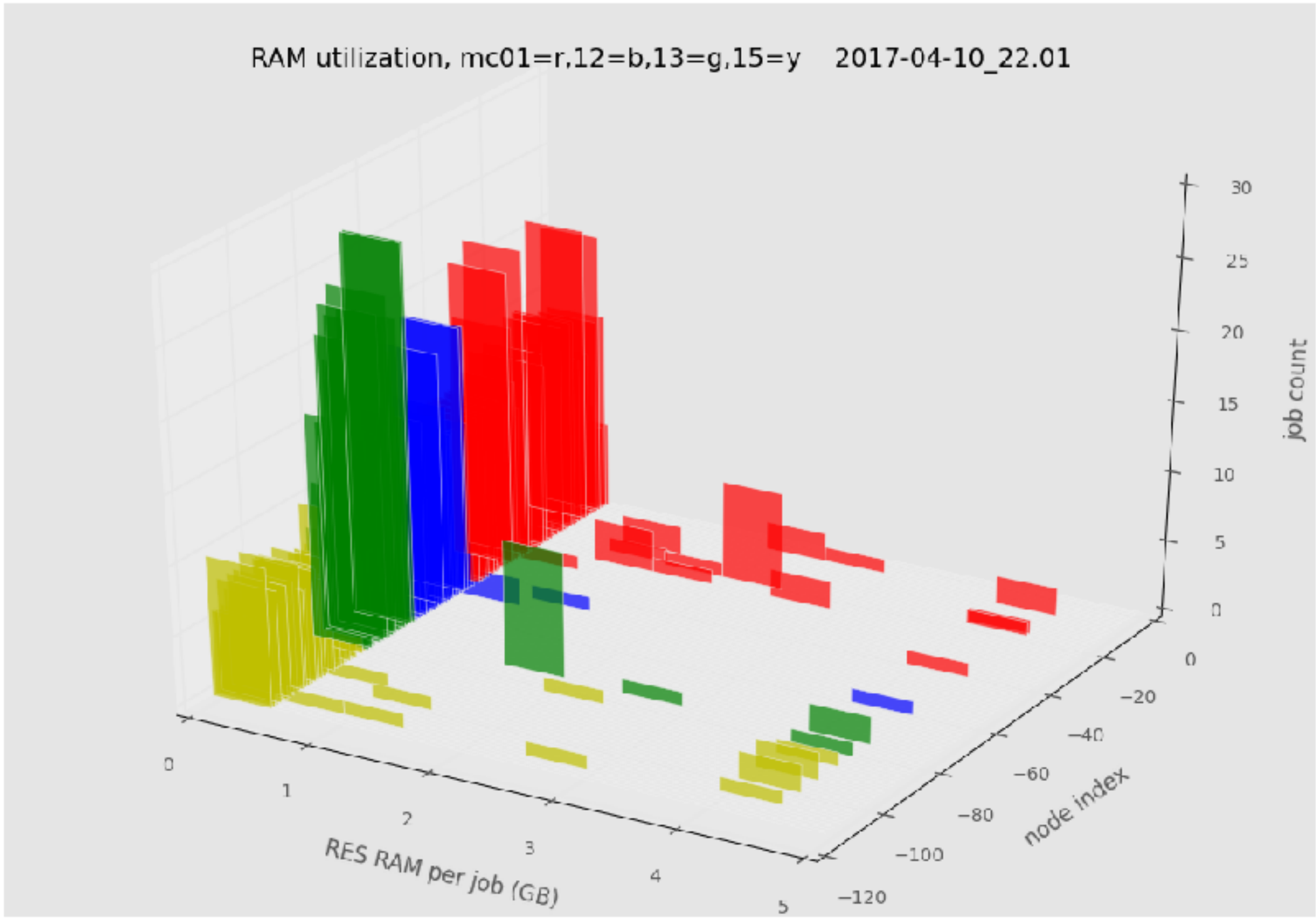
116 UGE nodes, 4578 job slots (potentially),
1300 jobs run, cluster is 40% loaded (last Monday)



More details: http://portal.nersc.gov/project/mpccc/balewski/ugeLoad/latest/

RAM/job distribution

RAM/job <0.5 GB



xrootd files re-distribution

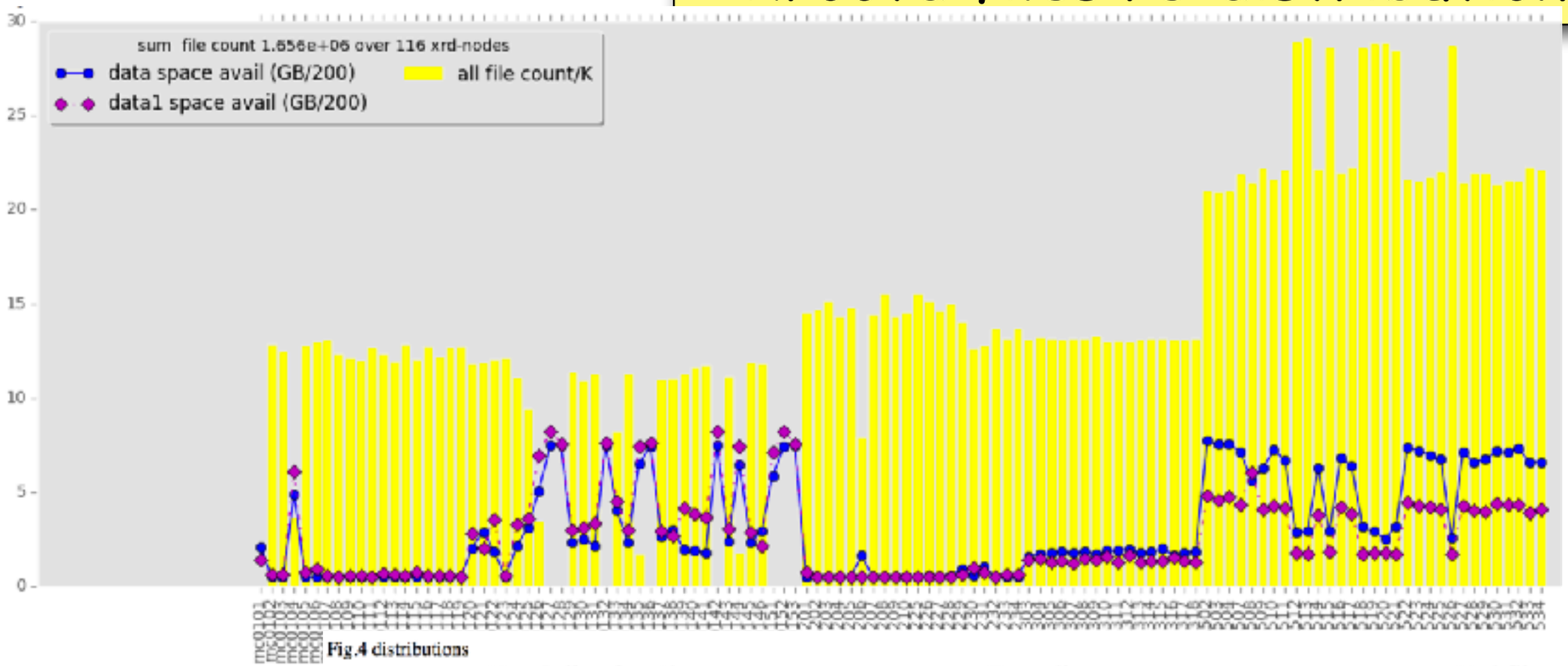


Fig.4 distributions

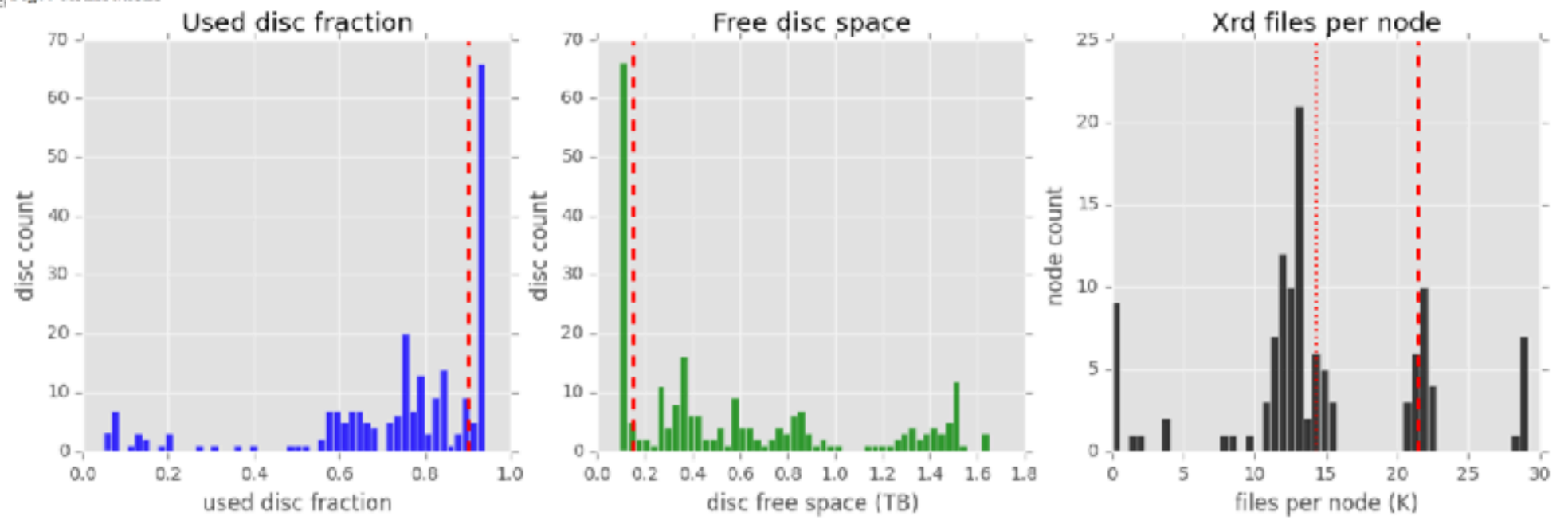


Table produced on 2017-04-10_18.53

highDiscFract	lowFreeDisk	
38 nodes	38 nodes	27 nod

/project utilization

http://portal.nersc.gov/project/star/jthaeder/diskUsage/overview/indexExt.html

STAR is out of comfort zone

FillStatus (Quota): *PROJECT* (2017-04-10 20:04)

star - size

64.526/70.000 TB (92.18%)

star - inodes

19891240/20000000 (99.45%)

---

starprod - size

118.555/130.000 TB (91.19%)

starprod - inodes

8926036/20000000
(44.63%)

---

alice - size

42.329/60.976 TB (69.41%)

alice - inodes

16694712/25000000 (66.77%)

FillStatus (Quota): *PROJECTA* (2017-04-10 20:04)

starprod - size

168.418/190.000 TB (88.64%)

starprod - inodes

6112489/20000000
(30.56%)

Announcements

Bi-weekly office hours 12:30 -2:30pm
Thursday, April 13, 27, 59-4016-CR

PDSF user meeting

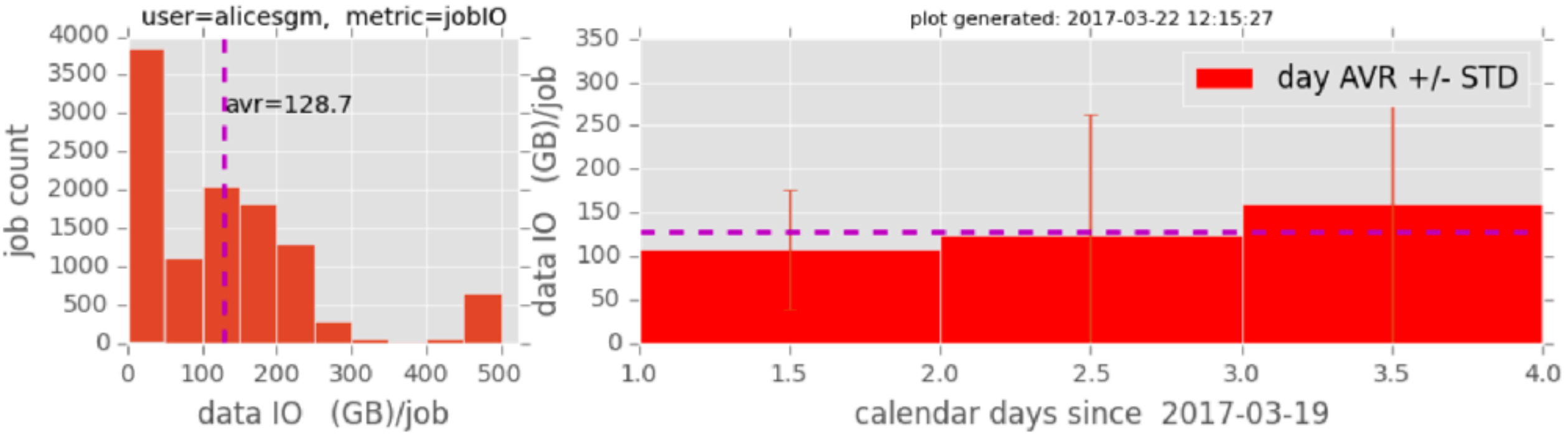
- Tuesday, May 9, 11am - 12pm, 59-3034-CR

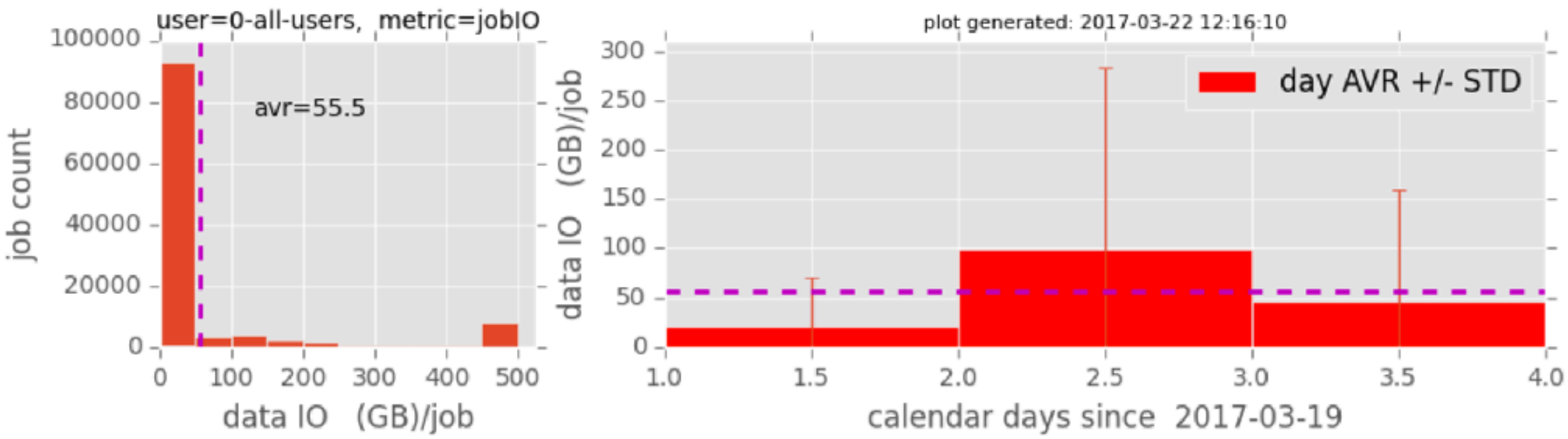
Outages

—Outage to add new Cori Haswell Cabinets: second half of April
—Outage for Quarterly Maintenance: May 16-18
—Memorial Day Holiday (No Consulting or Account Support): May 29

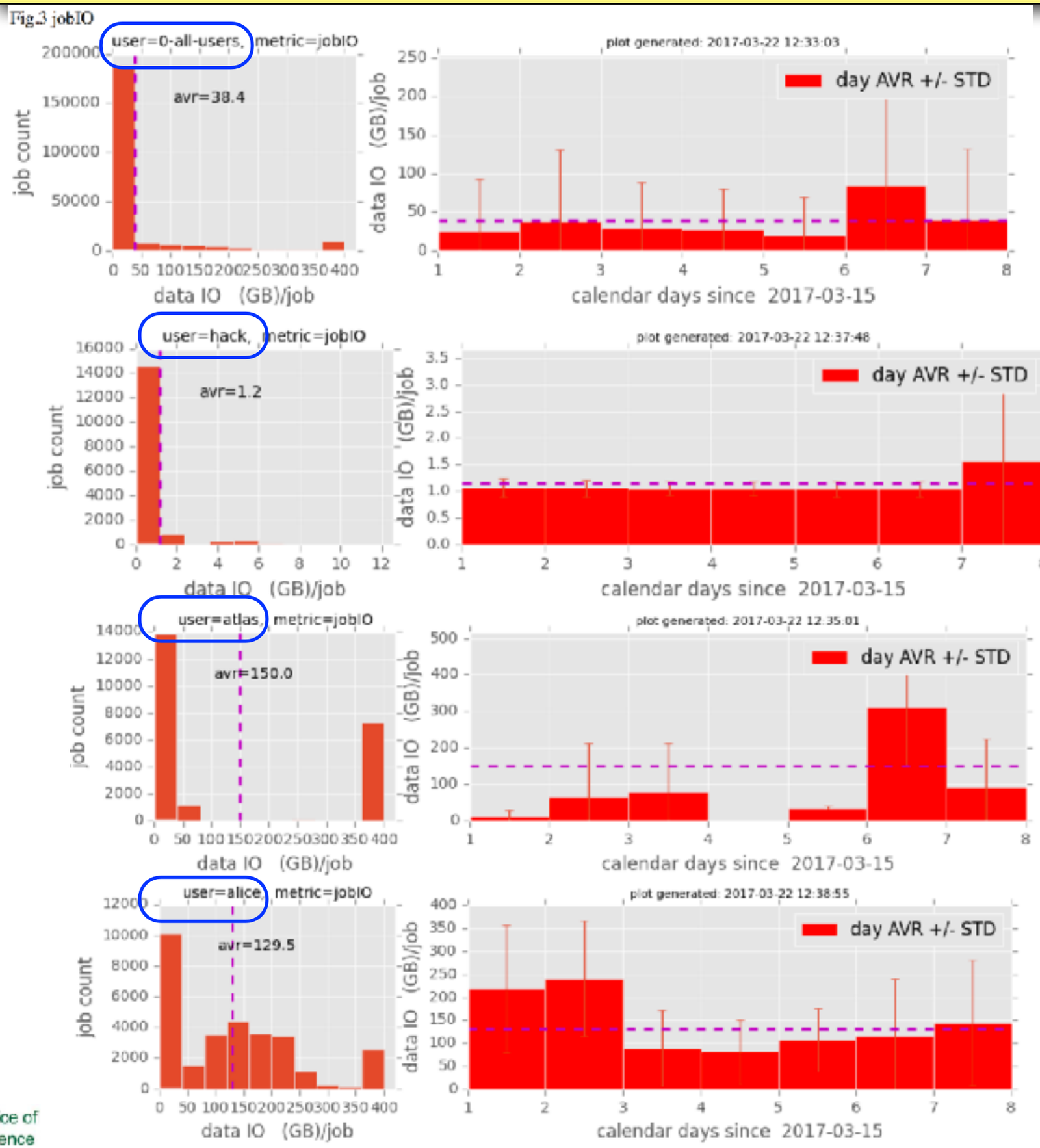
Devaluation:
First Quarterly Allocation Reduction: April 12 (this week)

job io monitor





job IO - week average



STAR embedding on Cori in Shifter/SL64

60 r4s task per node

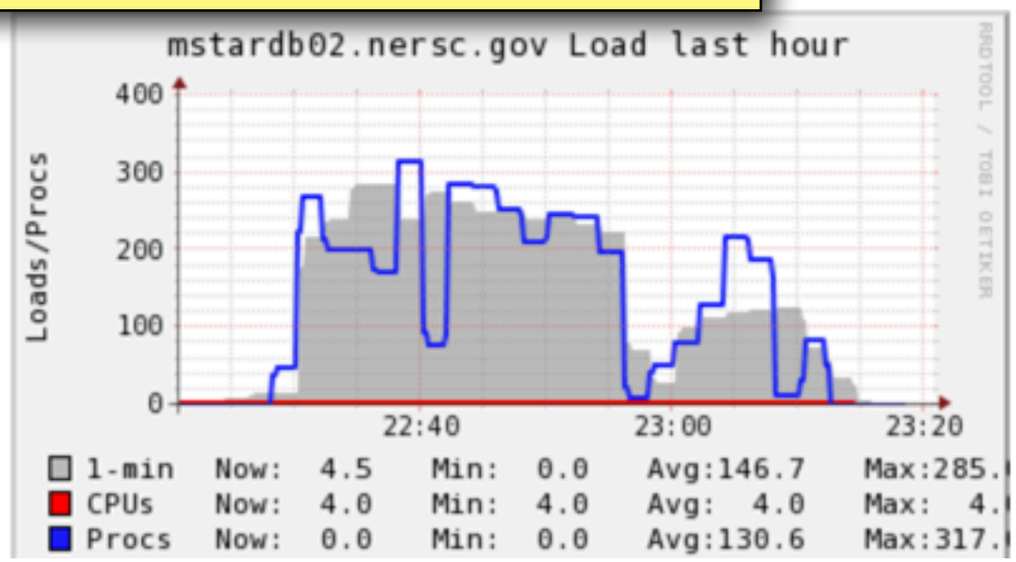
```
free -g
             total       used       free     shared    buffers     cached
Mem:           126         73         52          0          0         10
-/+ buffers/cache:         62         63
Swap:            0          0          0
top - 23:20:07 up 3 days,  9:24,  0 users,  load average: 59.52, 59.48, 54.48
Tasks: 677 total,  62 running, 615 sleeping,   0 stopped,   0 zombie
%Cpu(s): 41.1 us,  0.2 sy,  0.0 ni, 58.6 id,  0.0 wa,  0.0 hi,  0.0 si,  0.0 st
KiB Mem:  13216380+total, 76871760 used, 55292052 free,   100120 buffers
KiB Swap:        0 total,        0 used,        0 free. 10958920 cached Mem

  PID USER      PR  NI    VIRT    RES    SHR S   %CPU  %MEM     TIME+ COMMAND
    1  16995 balewski  20   0 1484276 1.074g  93276 R 100.00 0.852  39:53.75 root4star
    2  17777 balewski  20   0 1495544 1.095g  97052 R 100.00 0.869  38:44.61 root4star
    3  20928 balewski  20   0 1458492 1.051g  95424 R 100.00 0.834  39:06.72 root4star
    4  24046 balewski  20   0 1477820 1.070g  96360 R 100.00 0.849  39:15.17 root4star
    5  26774 balewski  20   0 1544608 1.142g  93240 R 100.00 0.906  38:21.16 root4star
    6   9801 balewski  20   0 1477340 1.070g  95764 R 100.00 0.849  40:12.45 root4star
    7   9802 balewski  20   0 1513796 1.109g  98040 R 100.00 0.880  39:59.50 root4star
    8  10072 balewski  20   0 1514864 1.107g  98828 R 100.00 0.878  40:15.63 root4star
    9  10353 balewski  20   0 1500460 1.093g  97844 R 100.00 0.867  40:33.31 root4star
   10  10732 balewski  20   0 1474472 1.069g  96984 R 100.00 0.848  40:12.61 root4star
   11  11126 balewski  20   0 1464792 1.055g  94736 R 100.00 0.837  34:58.26 root4star
   12  11516 balewski  20   0 1467348 1.055g  93572 R 100.00 0.837  32:38.22 root4star
   13  11907 balewski  20   0 1489552 1.082g  98036 R 100.00 0.859  39:49.53 root4star
   14  12297 balewski  20   0 1463256 1.056g  96176 R 100.00 0.838  37:36.07 root4star
   15  12688 balewski  20   0 1500488 1.098g  97752 R 100.00 0.871  40:12.60 root4star

   51  28717 balewski  20   0 1475208 1.066g  95408 R 100.00 0.846  37:34.33 root4star
   52  29106 balewski  20   0 1529152 1.122g  94064 R 100.00 0.890  38:09.74 root4star
   53  29494 balewski  20   0 1490808 1.086g  96168 R 100.00 0.861  36:11.60 root4star
   54  29889 balewski  20   0 1500088 1.097g  97308 R 100.00 0.870  37:53.78 root4star
   55  30337 balewski  20   0 1504052 1.095g  95376 R 100.00 0.869  37:53.20 root4star
   56  30669 balewski  20   0 1480480 1.075g  97076 R 100.00 0.853  38:39.54 root4star
   57  31058 balewski  20   0 1449216 1.038g  93300 R 100.00 0.824  37:20.52 root4star
   58  31446 balewski  20   0 1484268 1.073g  92828 R 100.00 0.852  38:02.71 root4star
   59  31926 balewski  20   0 1461488 1.054g  96168 R 100.00 0.836  37:08.48 root4star
   60  32224 balewski  20   0 1463356 1.056g  96260 R 100.00 0.838  37:36.12 root4star
```

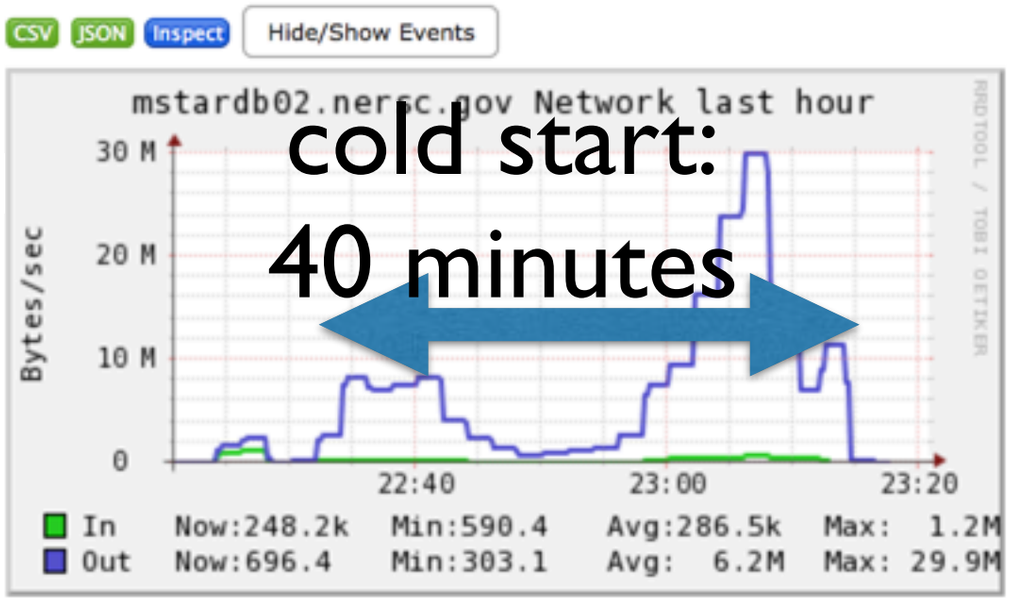
STAR embedding on Cori in Shifter/SL64

600 r4s 2-hour jobs staring within few seconds




```
 bfcMixer_Tpx($NUM_EVE, "$daqN", "$tagsN", 0, 12.0, -0.8, 0.8, -200.0, 200.0,
100.0, 169, 8, triggers, "P16idpp200", "FlatPt", 0, “$fzdN");
```

Some r4s tasks spent 30 minutes in 1st event
this is 30% tax on 2hour task




```
Event [no. 1/run 16082055/evt. 1514/Date.Time 20150324.25959/sta 0] Real Time =    2007.52 seconds Cpu Time =     140.38 seconds
Event [no. 2/run 16082055/evt. 8718/Date.Time 20150324.30002/sta 0] Real Time =      95.34 seconds Cpu Time =      94.98 seconds
Event [no. 3/run 16082055/evt. 29632/Date.Time 20150324.30010/sta 0] Real Time =     87.19 seconds Cpu Time =      86.98 seconds
Event [no. 4/run 16082055/evt. 29957/Date.Time 20150324.30010/sta 13] Real Time =    30.59 seconds Cpu Time =      30.50 seconds
Event [no. 5/run 16082055/evt. 41749/Date.Time 20150324.30015/sta 13] Real Time =    35.47 seconds Cpu Time =      35.40 seconds
Event [no. 6/run 16082055/evt. 46231/Date.Time 20150324.30017/sta 0] Real Time =    111.63 seconds Cpu Time =     111.14 seconds
Event [no. 7/run 16082055/evt. 53079/Date.Time 20150324.30019/sta 13] Real Time =    51.60 seconds Cpu Time =      51.44 seconds
```